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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

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**MEMORANDUM**

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

**SUBJECT: EXTENSION OF EXPOSURE PERIOD FOR RESIDENTS OF HOMES  
TREATED WITH METHYL BROMIDE**

**TO: Linda Kutney**  
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**THRU: John Tice, Acting Head** *J. Tice 5/14*  
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**THRU: Larry Dorsey, Acting Chief** *Larry Dorsey 5/18/92*  
Occupational and Residential Exposure Branch

OREB provided estimates of the daily exposures of the residents of homes fumigated with methyl bromide (MB) (1). The estimates were derived using the assumption that an individual spends 15 hours in the home, one third of this time performing light tasks and two thirds at rest. SACB has requested OREB to provide an additional assessment based on the assumption that an individual is in the home for 24 hours per day. Other assumptions are, such as body weights and respiratory rates, are the same as those used in the previous assessment. These assumptions are repeated below:

- 1) An average male resident has a body weight of 70 kg and a female resident weighs 60 kg.
- 2) The average male resident has respiratory volumes of 0.44 m<sup>3</sup> and 1.7 m<sup>3</sup> per hour while at rest and while performing light tasks, respectively. Females are assumed to have corresponding respiratory volumes of 0.27 m<sup>3</sup> per hour while at rest and 0.96 m<sup>3</sup> per hour during light tasks.

If an average resident is assumed to spend 24 hours per day in the home and one third of this time is spent performing light

tasks with the remaining time spent at rest, the daily respiratory volumes would be:

For males:

$$\begin{aligned} \text{Resp Volume m}^3/\text{day} &= 16 \text{ hrs/day} \times 0.44 \text{ m}^3/\text{hr} + 8 \text{ hrs} \times 1.7 \text{ m}^3/\text{hr} \\ &= 21 \text{ m}^3/\text{day} \end{aligned}$$

7.04      Rest      13.6  
Light Work

20.6

For females:

$$\begin{aligned} \text{Resp Volume m}^3/\text{day} &= 16 \text{ hrs/day} \times 0.27 \text{ m}^3/\text{hr} + 8 \text{ hrs} \times 0.96 \text{ m}^3/\text{hr} \\ &= 12 \text{ m}^3/\text{day} \end{aligned}$$

4.3      Rest      7.7

12.0

The current label for methyl bromide requires aeration of the fumigated structure until the air concentrations reach 5 ppm. A recent study submitted by DOW Chemical company for another fumigant, sulfuryl fluoride indicates that, upon closing the house after aeration, the air levels of both sulfuryl fluoride and methyl bromide increase. Toxicology Branch I has requested OREB to calculate Margins of Exposure (MOEs) for MB. The toxicological endpoints of concern and relevant physiological parameters were provided by the Toxicology Branch. OREB has provided the MOE calculations for three concentrations of MB. These values are; the label required reentry concentration, 5 ppm for both compounds; the DOW measurement value, 18.6 ppm for MB; and the results of 72 hours of aeration as measured by CALEPA. These MOEs are presented in Table 1.

Table 1. Margins of Exposure (MOE) for Residents of Homes Treated with Methyl Bromide when 24 hours per day are spent in the residence.

Scenario	ppm	mg/m <sup>3</sup>	Daily Dose (mg/kg/day)		Effect	Species	NOEL ppm	NOEL mg/kg/day	MOE Males	MOE Females
			Males	Females						
Label Required	5	19.40	5.8	3.9	Developmental	Rabbit	40	37		9.6
DOW	18.6	72.17	21.7	14.4			40	37		2.6
Measurement										
72 Hr Aeration	0.142	0.55	0.17	0.11			40	37		337.6
Label Required	5	19.40	5.8	3.9	Developmental	Rat	20	19		4.9
DOW	18.6	72.17	21.7	14.4			20	19		1.3
Measurement										
72 Hr Aeration	0.142	0.55	0.2	0.1			20	19		172.4
Label Required	5	19.40	5.8	3.9	Chronic	Rat	30	28	4.8	7.2
DOW	18.6	72.17	21.7	14.4			30	28	1.3	1.9
Measurement										
72 Hr Aeration	0.142	0.55	0.2	0.1			30	28	169.4	254.1
Label Required	5	19.40	5.8	3.9			3	2.8	0.5	0.7
DOW	18.6	72.17	21.7	14.4			3	2.8	0.1	0.2
Measurement										
72 Hr Aeration	0.142	0.55	0.2	0.1			3	2.8	16.9	25.4
Label Required	5	19.40	5.8	3.9	Acute LC50		2700	N/A		
DOW	18.6	72.17	21.7	14.4	(30 min.)		2700	N/A		
Measurement										
72 Hr Aeration	0.142	0.55	0.2	0.1			2700	N/A		
Human Effects (unknown duration)	35	135.80	40.7	27.2			35.0		N/A	N/A

REFERENCES

- 1) Memorandum from D. Jaquith (OREB) to L. Kutney (SACB)  
titled "Documentation of Exposure Assessment for Methyl  
Bromide Used in Structural Fumigation:", dated May 1, 1992.

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